Public Health Reports

Vol. 58 • AUGUST 27, 1943 • *No. 35*

STUDIES ON TRICHINOSIS

XV. SUMMARY OF THE FINDINGS OF *TRICHINELLA SPIRALIS* IN A RANDOM SAMPLING AND OTHER SAMPLINGS OF THE POPULATION OF THE UNITED STATES [1,2]

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During the past several years there has been conducted in this laboratory a survey of trichina infection through the examination of diaphragm material from persons coming to necropsy in hospitals in various parts of the United States. At different times interim reports (*1, 2, 3, 4, 5*) have been made on the progress of this survey. The work has now been completed and it is proposed in this paper to summarize the general results of the survey and in a subsequent publication to present the epidemiological considerations.

METHODS OF COLLECTION AND EXAMINATION OF MATERIAL

The survey was based on the examination of diaphragm muscle taken from routine necropsies of persons over one year of age without regard to the clinical or anatomical diagnosis. Instructions to the cooperating pathologists called for as much of the diaphragm, other than the tendinous portion, as was available. The weight of the diaphragm tissue received varied between 3 and 200 gm. with a mean of 72.6 gm. in the base series and a mean of 42.9 gm. in all other series. The specimens from the hospitals in Washington, D. C., were collected once a week. Those from points outside of Washington were forwarded by mail packed with an amount of dry boric acid sufficient to preserve the material while en route. This method of preservation of the muscle did not affect the viability of any trichina larvae which may have been contained in the material. The boric acid removed some of the normal moisture content of the muscle but the amount removed was not sufficient to affect significantly the counts of larvae present in a given amount of tissue (*5*).

[1] A list of the preceding papers in this series is given under "References."
[2] From the Division of Zoology, National Institute of Health.

Each diaphragm was examined by two methods. A detailed description of these methods and the technique employed for the preparation of the material has been published by Hall and Collins (*1*), Nolan and Bozicevich (*3*), and Kerr, Jacobs, and Cuvillier (*5*). In brief, a direct microscopic examination was made of a representative 1-gram sample which was pressed between two heavy plate glass slides held in a steel frame tightened by means of thumb screws. This material was examined under a low-power dissecting microscope (12.5 ocular and 1.0 objective) and the number of larvae and the condition of the larvae, i. e., whether they were alive or dead, calcified or uncalcified, were recorded. The remainder of the diaphragm was ground in a food chopper, digested in artificial gastric juice for approximately 18 hours, and then examined for trichina larvae by the use of the Baermann apparatus which is described in detail in the above-mentioned reports.

SOURCES OF THE MATERIAL

The various series of examinations reported herein were classified in accordance with the source of the material. These series are defined as follows:

1. The so-called *base series* consisted of diaphragms furnished by 10 hospitals in Washington, D. C., and 4 United States Naval Hospitals and 2 United States Marine Hospitals in eastern seaboard cities. The names and locations of these hospitals were given previously (*5*). It has been pointed out by Hall and Collins (*1*) that necropsy examinations from persons from the District of Columbia would probably be more representative of the population of the country as a whole than would material coming from any other one section. This is probably true to the extent that the population of Washington, D. C., is one of very cosmopolitan character because of the relatively low percentage of native-born individuals as compared with the very high percentage of persons who have come to Washington because of government employment or because of other opportunities afforded by the marked expansion in population in recent years.

2. The *negative series* was designed to include diaphragms from persons who had resided in States in which clinical trichinosis had never been reported at the time this survey was inaugurated. These States included New Hampshire, Oklahoma, Arizona, Wyoming, and Nevada.

3. The *traumatic series* was composed of diaphragm material from persons who suffered sudden natural death, and from persons who suffered traumatic death and were not hospitalized or were hospitalized for less than 24 hours. This series was designed to evaluate the criticism that a previous trichina infection may have influenced the hospitalization of individuals represented in the other series.

4. The *random series* consisted of diaphragm material selected at random from hospitals chosen on a chance basis. These hospitals were selected from a list of such institutions approved annually by the American Medical Association for residencies in specialties. The list used [J. Am. Med. Assoc., v. 107 (9), Aug. 29, 1936] contained the names of 726 hospitals reporting 100 or more autopsies per year, those with a smaller number of autopsies being discarded for our purposes. Duplications in the list reduced the actual number of institutions in this category to 147. Each of these hospitals was given an identifying number and the numbers were drawn at random as additional material was needed for the series. Each hospital was requested to furnish 10 diaphragms; some furnished a few more than this number while a few failed to complete their quota. In selecting the diaphragms the pathologist was requested to supply every other diaphragm if the total number of autopsies conducted during the year was between 100 and 200. In cases in which the total number yearly was between 200 and 300, every third diaphragm was selected and so on up to every tenth diaphragm if the number of yearly autopsies was over 1,000.

A total of 113 of the 147 hospitals actually participated in furnishing material for the series; in addition 2 hospitals supplying diaphragms for the rural series furnished a few specimens from individuals who had lived in cities, this material being placed in the random series. Twelve of the 147 hospitals were not contacted, while 22 others were contacted but failed to indicate a willingness to cooperate. The fact that such a large percentage of hospitals available from the list in question actually cooperated in the survey would tend to nullify the original conception that selection was to be on strictly a chance basis. Actually, therefore, this series cannot properly be termed a random one but can be considered as providing a representative sample of necropsy material in hospitals throughout the United States over the period of time covered by this survey.

5. The *rural series* consisted of diaphragms from persons who had resided on farms or in villages of 1,000 population or less. The series was designed to counterbalance the large preponderance of urban cases in the other series and to furnish evidence as to the incidence of trichinae in a population group which was thought to be exposed to infection in a manner somewhat different than are persons residing in urban areas. Considerable difficulty was encountered in securing necropsy material from persons in the rural population chiefly because hospitals in small cities and towns seldom have a resident pathologist on the staff and because relatively few autopsies are conducted in such institutions. Furthermore, many such autopsies are carried out after the body has been embalmed. Much of the material furnished us fell in this category and approximately 100 such diaphragms were

examined but were not included in this series because the digestion of preserved material is unsatisfactory and does not furnish information which would be comparable with the data obtained from the examination of unembalmed material.

6. The *Washington State series* was carried on in cooperation with the State Health Department and was intended to furnish evidence concerning opportunities for exposure to trichinosis in that State.

7. The *Oregon State series* was likewise a cooperative project with the State Health Department. It was started rather late in the course of the survey and was interrupted because of the war-induced shortage of personnel on the medical staffs of the hospitals involved.

8. The *Jewish series* included diaphragms from orthodox and unorthodox Jews with the view of demonstrating the degree of protection furnished this religious group by the Mosaic code.

TABLE 1.—*Distribution of hospitals cooperating in various series of trichinosis survey*

Series	Number of hospitals	Number of cities represented	Number of States represented
Base	16	7	5 and D. C.
Negative	16	12	6
Traumatic	2	2	2
Random	115	66	27
Rural	51	44	23
Washington State	4	2	1
Oregon	4	2	1
Jewish	1	1	1
Total	209	136	66 and D. C.
Duplications	20	22	29
Total less duplications	189	114	37 and D. C.

Table 1 shows the number of hospitals and the number of cities and States represented in each of the series in the survey. The random series represented by far the most widely distributed sources of material since the diaphragms comprising this series were furnished by 115 hospitals in 66 cities in 27 States. Although the rural series contained a relatively small number of diaphragms, these diaphragms came from 51 hospitals in 44 cities in 23 States. The negative series was originally intended to comprise the 5 States mentioned above but material was actually received from 6 States for the reason that one of the cooperating pathologists in New Hampshire also conducted autopsies in a neighboring State, Vermont, and supplied a single diaphragm from that State. In all, the necropsy material represented in the survey came from 189 hospitals located in 114 cities in 37 States and the District of Columbia. Nearly every type of institution was represented, including general hospitals, children's hospitals, industrial hospitals, and those devoted to the treatment of cancer, tuberculosis, mental diseases, chronic diseases, and contagious diseases.

The hospitals included those operated by private individuals, private organizations, States, counties, cities, and governmental agencies such as the Army, Navy, Public Health Service, and Veterans' Administration. The divergent character and wide distribution of the institutions furnishing material for the survey assured an adequate sampling of the various population groups in the United States.

INCIDENCE OF INFECTION

Table 2 presents the results of the examination of the diaphragms in the various series. The survey comprised a total of 5,313 cases, of which 855, or 16.1 percent, were positive for trichinae. If the Jewish series is omitted from the reckoning, the other examinations totaled 5,113 diaphragms, of which 854, or 16.7 percent, were positive. This figure is probably more representative of the true incidence figure than is the 16.1 percent because of the low incidence in the Jewish group which is not itself representative of the Jewish population of the entire country, since all specimens came from only one hospital in New York City.

TABLE 2.—*Findings of* Trichinella spiralis *in various series of diaphragm material examined in the National Institute of Health from 189 hospitals in 37 States and the District of Columbia*

Series	Number of diaphragms examined	Number of diaphragms found positive	Percent diaphragms found positive
Base (diaphragms from 10 hospitals in Washington, D. C., 2 Marine and 4 Naval hospitals)	3,000	488	16.3
Negative (diaphragms from States in which clinical trichinosis had never been reported)	200	35	17.5
Traumatic (diaphragms from persons suffering sudden death)	283	48	17.0
Random (diaphragms selected at random from hospitals selected at random)	1,125	206	18.3
Rural (diaphragms from persons residing on farms or in villages)	295	36	12.2
Washington State (diaphragms from residents of this State)	200	40	20.0
Oregon State (diaphragms from residents of Oregon)	10	1	----------
Total	5,113	854	16.7
Jewish (diaphragms from orthodox and unorthodox Jews)	200	1	0.5
Grand total	5,313	855	16.1

In comparable series there was a wide variation in the number of positive specimens in each unit of 100 cases, this variation ranging from 11 to 24. Considering the 5,313 cases as a whole, the standard error of the incidence of 16.1 percent is ±0.5041 when computed by the formula $\sqrt{\frac{pq}{n}}$, where p is the percentage of positive cases, q the percentage of negative cases, and n the total number of cases examined.

Since the incidence of trichinae in the base series corresponds so closely to that obtained for all other series, it is believed that the contention of Hall and Collins (*1*) concerning the cosmopolitanism of the group represented in this series is amply substantiated. It would appear also that the incidence which may be found in necropsy material from similar population groups elsewhere in the United States will not differ materially from the percentage of positives encountered in this series.

In addition to the 283 cases with 48 positives represented in the so-called traumatic series, there were included in the other series in the survey a total of 54 cases with 12 positives which come within the specifications for material in this series. Thus represented in the survey as a whole there is a total of 337 cases in which the individuals suffered sudden natural death or traumatic death without hospitalization or with hospitalization for less than 24 hours. Sixty, or 17.8 percent, of the 337 cases were positive for trichinae. Of these total cases, 95 represented cases of sudden natural death, 140 cases of accidental death, 60 cases of homicide, 34 cases of suicide, and 8 cases in which the nature or the cause of death was not known. Statistically the incidence of trichina infection encountered in these cases of sudden death does not differ significantly from the general incidence figure, thus indicating that the examination of material from persons coming to necropsy in hospitals provided valid information concerning the incidence of the trichina parasite in that part of the population represented in the present sampling.

The random series comprised 1,125 cases, of which 206, or 18.3 percent, were positive. Because of the divergent origin of the material, the results obtained in the examination of diaphragms in this series offer strong support in the way of validating the findings in the other series.

The incidence figure of 12.2 percent for the 295 cases in the rural series barely shows a significant statistical difference from the percentage obtained in the urban material, as represented by most of the diaphragms in the other series. However, when there are added to the number of diaphragms in the rural series, the 141 diaphragms from the members of the rural population represented in the other series, there is a total of 436 cases, of which 64, or 14.7 percent, were positive for trichinae. This figure is not significantly different from that of the urban material and on the basis of these examinations one cannot conclude that rural dwellers are less frequently exposed to trichinosis than are members of the urban population. It has been quite well established that swine fed on uncooked garbage represent the chief source of trichina infection in market pork and such hogs, for the most part, go on the market in cities. Persons residing on farms or in villages usually buy less market pork than do urban dwellers and might reasonably be less exposed to infection through pork from swine commercially raised on uncooked garbage. However, such a theory is not substantiated by the data in hand.

The results of the examination of diaphragms in the Washington State series, in which 40, or 20.0 percent, of the 200 cases were positive for trichinae, are not statistically different from the results obtained for the survey as a whole. Apparently the degree of exposure to trichinosis in this State is no different from that encountered in most other parts of the United States, as indicated by the results of the present survey, and a larger series of cases from the State would probably demonstrate an incidence of trichinae very similar to the incidence found in the survey as a whole.

The Jewish series with only one case positive of the 200 examined furnishes a striking contrast to the results of the other series. According to the records of the hospital from which these cases were derived, 82 of the individuals in this series were orthodox Jews, 23 were unorthodox, and the religious tenets of the remaining 95 were unknown. It is probable that a high percentage of these 95 were orthodox, since 75 percent of the cases in the series were of foreign birth and 70.5 percent were over 45 years of age, and individuals in these categories are less likely to have deviated from their faith. It is also probable that many unorthodox individuals in this series were less exposed to trichina infection because, despite their unorthodoxy, they lived in a community with more orthodox individuals and would therefore be less likely to consume pork. Moreover, the criteria for orthodoxy and unorthodoxy are loose, as is evidenced by the fact that the one positive case occurred in an individual who had claimed to have followed his religious tenets strictly. It is possible that a survey of Jews from various parts of the country, rather than only from a metropolitan area like New York, would have revealed a somewhat higher incidence figure. However, this survey amply demonstrates the protection afforded by adherence to the Mosaic code.

In table 3 is recorded the distribution of the cases by State and geographical regions with separation into urban and rural groups. Allocation is made to the State of origin of the individual, where known, with a result that a total of 41 States and the District of Columbia is represented even though the diaphragm material came from hospitals in only 37 States and the District of Columbia. Many of the States are represented by relatively few cases and for this reason it is not possible to make comparisons between the incidence figures for States. However, the incidence of trichinae on a regional basis shows in most cases no significant variations. The Middle Atlantic States represented by 809 cases show an incidence of 12.9 percent. However, 200 of the cases were included in the Jewish series and only one of these cases was positive for trichinae. Omitting these 200 cases as overloading the sample from this area, there would be 103 positives in

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609 cases, or an incidence of 16.9 percent. This incidence is not significantly different from that noted for the survey as a whole. The East South Central, West South Central, and Mountain States are represented by relatively few cases and on the basis of this small number definite conclusions cannot be drawn as to the probable incidence of human infection with trichinae in these areas.

TABLE 3.—*Distribution of cases by urban and rural population groups in all States represented with allocation to State of origin where known*

State	Diaphragms from urban population		Diaphragms from rural population		Diaphragms from both population groups		
	Total number	Number positive	Total number	Number positive	Total number	Number positive	Percent positive
NEW ENGLAND							
Maine	------	------	------	------	------	------	------
New Hampshire	84	14	34	4	118	18	15.3
Vermont	1	0	9	4	10	4	------
Massachusetts	130	21	------	------	130	21	16.2
Rhode Island	10	3	------	------	10	3	------
Connecticut	10	4	8	0	18	4	------
Total for area	235	42	51	8	286	50	17.5
MIDDLE ATLANTIC							
New York	451	40	5	1	456	41	9.0
New Jersey	44	9	1	0	45	9	------
Pennsylvania	302	52	6	2	308	54	17.5
Total for area	797	101	12	3	809	104	12.9
EAST NORTH CENTRAL							
Ohio	82	16	5	0	87	16	------
Indiana	28	6	24	7	52	13	------
Illinois	111	18	6	1	117	19	16.2
Michigan	61	10	16	0	77	10	------
Wisconsin	19	4	3	1	22	5	------
Total for area	301	54	54	9	355	63	17.7
WEST NORTH CENTRAL							
Minnesota	27	7	23	2	50	9	------
Iowa	9	1	28	5	37	6	------
Missouri	59	11	1	0	60	11	------
North Dakota	------	------	------	------	------	------	------
South Dakota	------	------	1	1	1	1	------
Nebraska	7	1	32	6	39	7	------
Kansas	5	0	6	1	11	1	------
Total for area	107	20	91	15	198	35	17.7
SOUTH ATLANTIC							
Delaware	------	------	1	0	1	0	------
Maryland	374	84	13	2	387	86	22.2
District of Columbia	2,485	389	40	5	2,525	394	15.6
Virginia	30	4	3	1	33	5	------
West Virginia	1	0	------	------	1	0	------
North Carolina	11	3	7	0	18	3	------
South Carolina	15	1	------	------	15	1	------
Georgia	23	2	10	0	33	2	------
Florida	10	2	5	0	15	2	------
Total for area	2,949	485	79	8	3,028	493	16.3
EAST SOUTH CENTRAL							
Kentucky	------	------	------	------	------	------	------
Tennessee	40	8	1	0	41	8	------
Alabama	21	4	13	2	34	6	------
Mississippi	------	------	10	1	10	1	------
Total for area	61	12	24	3	85	15	17.6

Table 3.—*Distribution of cases by urban and rural population groups in all States represented with allocation to State of origin where known*—Continued

State	Diaphragms from urban population		Diaphragms from rural population		Diaphragms from both population groups		
	Total number	Number positive	Total number	Number positive	Total number	Number positive	Percent positive
WEST SOUTH CENTRAL							
Arkansas	---	---	2	0	2	0	---
Louisiana	---	---	---	---	---	---	---
Oklahoma	49	9	38	8	87	17	---
Texas	20	2	1	1	21	3	---
Total for area	69	11	41	9	110	20	18.2
MOUNTAIN							
Montana	---	---	---	---	---	---	---
Idaho	---	---	---	---	---	---	---
Wyoming	2	0	---	---	2	0	---
Colorado	8	2	22	1	30	3	---
New Mexico	---	---	1	0	1	0	---
Arizona	42	3	1	0	43	3	---
Utah	---	---	---	---	---	---	---
Nevada	4	2	---	---	4	2	---
Total for area	56	7	24	1	80	8	---
PACIFIC							
Washington	184	35	16	5	200	40	20.0
Oregon	23	4	5	0	33	4	---
California	90	20	39	3	129	23	17.8
Total for area	302	59	60	8	362	67	18.5
Grand total	4,877	791	436	64	5,313	855	16.1

EFFICIENCY OF METHODS OF EXAMINATION

Table 4 shows the respective efficiencies of the microscopic and digestion-Baermann methods, singly and together, in detecting infections with live, mixed live and dead, and dead larvae in the 855 positive diaphragms encountered in the survey. The data in this table confirm previous conclusions regarding the respective efficacies of the two methods of examination in detecting larvae in various stages. It will be seen that the majority of the cases with live larvae were detected by the digestion-Baermann method, the majority of the cases with dead larvae by the direct microscopic method, and the majority of the cases with mixed live and dead larvae by a combination of the two methods. As regards all infections in which dead larvae were present, including cases with mixed live and dead larvae, the direct microscopic method detected 535, or 87.7 percent, of 610 such cases. Of the 387 cases in which live larvae were encountered, the digestion-Baermann method detected 381, or 98.4 percent. By itself, the direct microscopic method detected 67.1 percent of all infections with dead larvae, but only 1.6 percent of the infections with live larvae, and 1.4 percent of infections with mixed live and dead larvae. The digestion-Baermann method alone disclosed 72.2 percent of all infections with live larvae, 15.5 percent of all infections with mixed live and dead larvae, and 11.3 percent of infections with dead larvae. However, considering all 855 positive cases, the direct microscopic method detected 603, or 70.5 percent, while the digestion-Baermann method detected 535, or 62.6 percent. This apparently greater effectiveness of the microscopic method in detecting infections is attributable to the predominance of cases with only dead larvae. The chief point of emphasis, however, concerns the fact that either method used alone would have permitted a considerable percentage of the positive cases to pass unrecognized; specifically, the microscopic method would have missed 29.5 percent and the digestion-Baermann 37.4 percent of the positive cases.

TABLE 4.—*The respective efficiency of the microscopic and digestion-Baermann methods, singly and together, in detecting infections with live, mixed live and dead, and dead larvae in 855 positive cases examined by both methods*

State of larvae	Positive cases		Efficiency of methods of examination employed					
			Cases detected only by microscopic method		Cases detected only by digestion method		Cases detected by both methods	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Live	245	28.6	4	1.6	177	72.2	64	26.1
Mixed live and dead	142	16.6	2	1.4	22	15.5	118	83.1
Dead	468	54.8	314	67.1	53	11.3	101	21.6
Total	855	100.0	320	37.4	252	29.5	283	33.1

The use of the two methods of examination probably detected nearly all of the infections in this series of examinations, although actually the combination of the methods probably failed to disclose a small percentage of cases with dead larvae of the order of less than one per gram. In this connection, one of us (*6*) examined by the direct microscopic method a 10-gram sample from each of 100 diaphragms which had been recorded negative by the usual methods of examination. This further examination disclosed 6 positive specimens in the 100 cases, thus indicating that a small number of cases has undoubtedly been missed by the technique employed and that our incidence figure is probably less than is the true incidence of the parasite in the cases sampled.

COMPARISON OF FINDINGS WITH THOSE OF OTHERS

Several papers in this series have contained summaries of the findings of trichinae in surveys conducted by other investigators. The last of these summaries was included in the paper by Kerr, Jacobs, and Cuvillier (*5*). Since that paper was written, Sawitz (*7*) has reported 14 positives in 200 examinations at New Orleans; Butt and Lapeyre (*8*) found 31 positive cases in 170 at Los Angeles; Harrell and Johnston

(*9*) encountered 3 positives in 105 cases, mostly of rural origin, at Durham, N. C.; Oosting (*10*) obtained 27 positive findings in 134 examinations at Dayton, Ohio; Catron (*11*) found 44 positives in 300 individuals at Ann Arbor, Mich.; Gould (*12*) reported 93 positive cases among 500 examined at Eloise, Mich., and later (*13*) 185 positives in 731 additional examinations at the same place; Most and Helpern (*14*) encountered 22 positives among 100 cases in New York City; Merrill (*15*) failed to find any cases positive for trichinae in 47 examinations at Logan, Utah; and Meleney (*16*) reported 21 positives in 209 examinations at Nashville.

A summary of the published findings of other investigators indicates that, other than the National Institute of Health survey, there has been conducted in the United States a total of 6,618 examinations, of which 1,002, or 15.1 percent, were positive for *Trichinella spiralis*. In many of these surveys, only one method of examination was employed, although some workers examined histological sections as well as both direct microscopic and digestion-Baermann preparations. Most of the surveys were based only on the examination of diaphragm muscle, although in a few cases muscles other than the diaphragm were also included. When other muscles have been examined, the incidence of infection has usually been increased slightly since a few positive findings have been encountered in muscles other than the diaphragm when the latter muscle was negative for trichinae. For purposes of comparing the data of these other investigators with ours, we have analyzed their published findings. These findings have been placed on a basis comparable with that employed in the present studies by eliminating from consideration positive findings based on the examination of muscles other than the diaphragm and by the exclusion of findings obtained by the employment of methods of examination other than the direct microscopic and the digestion-Baermann methods. Where only one of these methods was employed, we have applied the respective correction figure obtained in the present survey in order to determine the approximate number of positive cases which were missed by failure to make use of the combined methods of examination. Based on such treatment of the data, our analysis discloses a total of 1,083 calculated positive cases in 6,618 diaphragm examinations, or an incidence of trichinae of 16.4 percent. If we add our findings of 855 positives in 5,313 cases, we arrive at a grand total of 11,931 such examinations for the United States, with 1,938 computed positives, or an incidence of 16.2 percent. Thus the sample is sufficiently large to warrant generalization and, since the data from the traumatic series indicate that hospitalization had no bearing on the incidence of infection, we can conclude that of the total persons dying in the United States over the period of these surveys, one out of six was infected with the trichina parasite.

DEGREE OF INFECTION AND STATE OF LARVAE

Degree of infection.—Table 5 presents data concerning the intensity of infection in terms of larvae per gram and the state of the larvae in the 855 positive diaphragms in this survey. It will be noted that the majority of the individuals were lightly infected since 733, or 85.7 percent, of the 855 cases had less than 11 larvae per gram of diaphragm muscle. Eighty-four, or 9.8 percent, had infections between 11 and 50 larvae per gram.

TABLE 5.—*Intensity of infection in terms of larvae per gram and state of larvae in 855 positive diaphragms*

Group No.	Larvae per gram	Number of cases	Percent of total cases	Number of cases with larvae in various states		
				Live	Mixed	Dead
1	Less than one	251	29.3	173	22	56
2	1-10	482	56.4	62	92	328
3	11-50	84	9.8	7	19	58
4	51-100	15	1.8	1	6	8
5	101-500	18	2.1	2	2	14
6	501-1,000	5	.6		1	4
7	Over 1,000	0				
		855	100.0	245	142	468

Unfortunately, evidence available at the present time is not sufficient to enable one to draw definite conclusions concerning the degree of trichina infection necessary to produce clinical symptoms of disease. It is probable that such a relationship would be governed by a number of variables, such as age, the general state of health, the presence of concomitant disease or borderline conditions affecting the general resistance of the individual, and other factors. On the basis of the results on the first 300 diaphragm examinations in the base series, Hall and Collins (*1*) arbitrarily defined an infection of 100 larvae or more per gram as one probably capable of causing pronounced symptoms of disease. Since that estimate was made, we have had good reason for revising these arbitrary standards because we have found infections of less than 100 larvae per gram of diaphragm muscle in persons succumbing to trichinosis. In fact, it is quite apparent that infections of 51 to 100 larvae per gram are capable of causing severe illness and it is highly probable that infections of 11 to 50 larvae per gram may cause pronounced symptoms. With regard to infections of less than 11 larvae per gram, until further evidence is available we can only say that such infections have an unknown bearing on the health of the individual. We do not intend to imply, of course, that any sharp line of demarcation can be drawn between the degree of infection and its relation to clinical symptoms, nor do we mean to intimate, for example, that an infection of 11 larvae per gram will cause illness whereas an infection of 10 larvae may not do so. The groups are arbitrarily selected only for purposes of comparison.

On the basis of the above-mentioned estimates, it is seen that 4.5 percent of the positive cases had infections of more than 50 larvae per gram. From our present knowledge it seems reasonable to assume that these individuals probably suffered clinically at the time their trichina infection was acquired.

On the basis of evidence in the literature and that obtained from 174 positive cases in the base series, Nolan and Bozicevich (*3*) suggested with quite good reason that an infection of 1,000 or more larvae per gram might well be termed a critical one. It is of interest to note that in 855 positive individuals in 5,313 examinations we have not found any case of infection of over 1,000 larvae per gram. Gould (*13*) also failed to find any infections of this degree in the 278 positive cases in the 1,231 examined by him at Eloise, Mich. In fact, we are unable to locate in the literature any findings of 1,000 larvae or more per gram of diaphragm muscle in persons coming to necropsy from conditions other than clinical trichinosis. It appears probable that infections of this degree usually, if not invariably, result in death.

Clinical records and past histories of the individuals involved in this survey were not furnished by the cooperating pathologists and no general request was made for these data because of the burden such a request would have imposed. In only 6 of the 5,313 cases was effort made to obtain a detailed history of the patient. The first two of these cases are cited by Kerr, Jacobs, and Cuvillier (*5*). A third case involved the finding of an infection of 60 larvae per gram in a 6-year-old child who died of pneumococcic meningitis. The larvae were dead and calcified. Because of the early age at death and the presence of calcified larvae, effort was made to determine the age at which infection took place. The family physician had treated mother and child at various times over a 3-year period prior to the death of the boy. During this time, the mother had an influenza-like syndrome several times within a period of a few weeks, the diagnosis at the time of consultation being myositis and rheumatism. The child had influenza on one occasion and on another occasion suffered a gastro-intestinal upset accompanied by a pin-point rash on the shoulders and upper chest, and swollen tonsils. The diagnosis at that time was tonsillitis. No differential blood counts were made on either the mother or child on the occasion of any of the visits. Since the cysts and larvae were all calcified, it seems probable that infection had taken place earlier than 3 years before death. As the family had moved from a far distant State, it was not possible to obtain information as to the prior medical history.

A fourth case involved that of a 74-year-old female in which there was encountered an infection of 615 larvae per gram. The cysts were calcified and the larvae dead. Inquiry revealed that the medical history contained the statement that the woman had had trichinosis about 40 years before, apparently before emigrating from Germany to the United States. At that time trichinosis was a common disease in Germany and German physicians were thoroughly familiar with its manifold clinical manifestations. The other two cases in which information was obtained from the clinical history are referred to later in this paper.

In the past those individuals who have chosen to minimize the significance of trichinosis as a public health problem in this country have apparently set great store by the fact that most investigators who have carried out necropsy surveys for trichinae stated that no clinical history of trichinosis could be obtained in cases in which the parasite was found at autopsy. As a matter of fact, such statements carry very little weight and in no way refute the possibility that heavily infected individuals may not have had clinical trichinosis at some time during their life without the disease having been recognized as such. If a diagnosis of trichinosis was never made, the patient would certainly have no knowledge that he or she ever suffered from the disease and a notation of the fact would not be included in the medical history. Certainly, most patients would never remember all the attacks of influenza or similar conditions which they may have had during the course of their lifetime and would probably not regard with special significance any condition which might simulate such ailments, assuming that they were able to make any differentiation. The fact remains then that in the one case in this survey in which trichinosis appeared in the past history of the patient, the circumstance came to our notice. When no notation of this sort appears in the clinical history, it may mean that the patient has never had clinical symptoms, or it may mean that he or she has suffered from clinical trichinosis without the disease ever having been recognized. In any event, it is not safe to assume, as some have done, that the infection was of a subclinical nature.

In this connection, Wyrens, Tillisch, and Magath (*17*) have taken issue with individuals who have suggested that the incidence and degree of infection encountered in trichina surveys would tend to indicate that many cases of clinical trichinosis are not recognized as such at the time of illness. The reasoning of these authors would be much more convincing if they did not later in the course of their paper show that in only 6 of their 19 clinical cases of trichinosis was the disease recognized by the referring physician or the physician in the Mayo Clinic who first saw the patient. The other diagnoses in the series included nephritis in 2 cases, indeterminate diarrhea in 2, and conjunctivitis, sinusitis, traumatic headache, secondary anemia, encephalitis, neurosis and migraine, respectively, in the others.

State of larvae.—From table 5, it will be seen that infections with dead larvae predominated over infections with live larvae and infections with live larvae predominated over infections with mixed live and dead larvae. The predominancy of infections with dead larvae might well be expected since the majority of the cases represented are those of individuals dying past middle age. Larvae from infections acquired earlier in life would have had ample opportunity with the passing of years to die and calcify. The rapidity with which larvae may die is evidenced by the fact that in table 6 three of the four positive cases occurring in the age group 5 to 9 were represented by dead larvae.

TABLE 6.—*Degree of trichina infection as related to age at death in 855 positive cases*

Age at death	Number positive cases	Number of cases with the specified number of larvae per gram of diaphragm muscle					
		Less than 1	1-10	11-50	51-100	101-500	501-1,000
Under 5	1	1					
5-9	4	1	2		1		
10-14	8	6	1		1		
15-19	7	4	3				
20-24	21	6	13	2			
25-29	27	14	11	2			
30-34	37	15	18	4			
35-44	143	58	76	7		1	1
45-54	190	62	109	18		1	
55-64	186	47	99	26	4	7	3
65-74	156	29	102	14	4	6	1
75 and over	71	8	46	10	5	2	
Unknown	4		2	1		1	
Total	855	251	482	84	15	18	5

Of the 245 positives with live larvae, it will be noted that 173, or 70.6 percent, occurred in cases with less than one larva per gram of diaphragm muscle (table 5). This would seem to indicate some correlation between a high degree of infection and the rapidity with which trichinae die and calify, a theory which was proposed by Hall and Collins (*1*) on the basis of 41 positive diaphragms in 300 examinations in the base series. While the theory may be tenable, we do not feel that our data on a much larger number of positives either prove or disprove it, since there are too many evident exceptions. Moreover, it has already been pointed out that our technique fails to detect infections with dead larvae of the order of less than one per gram.

DEGREE OF INFECTION AS RELATED TO AGE AT DEATH

As seen from table 6, the degree of infection was found to increase with advancing years. Of the 438 infected individuals of 54 years of age or less, which is close to the median age of 53 years for all infected individuals, 38, or 8.7 percent, had infections of over 10 larvae per gram, whereas of the 413 individuals of 55 years and over, 82, or 19.9 percent, had infections of over 10 larvae per gram. While the 413 individuals of 55 years and over comprised 48.5 percent of the total number of positive individuals of known age, they harbored 68.3 percent of the infections of over 10 larvae per gram. Statistical calculations show that this difference in the percentage of heavier infections in the later years of life is not due to chance.

There are three possible explanations of the increase in degree of infection with advancing years. The first involves a possible difference in exposure to trichinosis earlier in the life of individuals in the older age groups of our series. The second explanation rests on the possibility that we have represented here only those persons who survived heavy trichina infections and that other individuals have had equally heavy trichina infections from which they succumbed earlier in life. The third explanation concerns the hypothesis that repeated infections occur in man and that these heavy infections do not necessarily represent a single exposure but may be due to superimposed infections. These three possibilities will be considered in turn.

There is no substantial evidence in favor of the view that individuals in the older age groups may have been more heavily exposed to trichinosis in their earlier years. However, the development of rapid slaughterhouse procedures has resulted in larger numbers of swine being killed at the individual packing plants, and there has been coincidentally a concentration of slaughterhouse business into large abattoirs. With this development the practice of making sausage and other processed meat products from the trimmings of a few animals has grown into the preparation of hundreds of pounds of such products from hundreds of hogs. Thus the trichina larvae present in the meat of a few infected animals are now diluted with many more pounds of uninfected meat, and the chances are conceivably greater that the small doses of larvae obtained from such meats may result in infections lighter than those which formerly occurred.

The possibility that the heavy infections in individuals in the higher age groups may represent severe cases which survived the disease while other equally heavy cases succumbed has some support in data which indicate that 74.2 percent of all persons reported to have died of trichinosis in the United States during the decade 1931–40 were under 55 years of age whereas in 1938, the median year of this survey, only 34.5 percent of the total deaths occurred before the age of 55. This hypothesis could be more properly evaluated if more information were available as to the numbers of larvae per gram resulting in clinical and fatal cases of trichinosis. Of interest in this regard is the fact that, occurring as an extremely casual circumstance, two of the diaphragms in our random series were from persons who actually died of trichinosis, even though the clinical and anatomical diagnoses incorrectly involved other conditions. Death in one of these cases occurred at the age of 13 years and death in the other at the age of 36 years. The former case falls in the group in table 6 having an infection of 51 to 100 larvae per gram of muscle while the latter case falls in the group of 501 to 1,000 larvae per gram. However, these cases also lend support to the third explanation offered above, that of the possibility of superimposed infections, since both of these cases represent fatal infections superimposed on an old infection as proved by the presence of old calcified cysts with dead larvae, unencysted third-stage larvae, and even second-stage larvae.

Because of the occurrence of these cases, in which live larvae were found along with dead and degenerated larvae, the possibility that the heavy infections in the older age groups represent superimposed infections has more basis than the other two hypotheses. Arrayed against this idea, however, is the evidence offered by the work of Ducas (*18*), McCoy (*19*), and numerous more recent investigators who have shown that a certain amount of resistance to superimposed infections follows an initial trichina infection in rats, and some writers reasoning by analogy have asserted that a similar resistance follows a trichina infection in man. In fact, Magath (*20*) has gone so far as to suggest that a light trichina infection, such as occurred in many of our positive cases, "may be looked upon as a benefit rather than a detriment" to the individual. We do not believe that the available evidence warrants an assumption of this sort. Apparently Magath, himself, later saw reason to doubt the validity of his statement, since in the paper by Wyrens, Tillisch, and Magath (*17*) it is stated that "the presence of immunity in man is only suggested by experimental studies with animals." This change of viewpoint was perhaps occasioned by the apparent finding of 2 cases of reinfection in the 19 cases of clinical trichinosis described by the above-mentioned authors, together with the fact that they noted the cases of second infections reported by Kaufman (*21*) and Lehrfeld and Breisacher (*22*).

In addition to these cases and to our 2 cases mentioned above, there must be added one record which we have of finding calcified cysts with dead larvae and unencysted third-stage larvae in muscle biopsied from a clinical case of trichinosis, and the record of Most and Helpern (*14*), who found several cases of superimposed infection among the 22 positives encountered in 100 diaphragm examinations in New York City. Evidence is also available from our survey data on cases with over 10 larvae per gram, which indicates further that superimposed infections do occur. Because of the lack of any marked differences in the condition of larvae or cysts, we have been unable to determine whether cases with only live or dead larvae represent one or more than one infection. However, a conservative appraisal of the 28 cases with mixed live and dead larvae with counts of over 10 larvae per gram indicated that 8 probably represented superimposed infections and 2 others, which have been discussed above, definitely represented such infections. In only 3 of these 10 cases, however, was the age at death over 53 years. This can be interpreted only as indicating that superimposed infections did not occur in the latter years of life in most individuals of the older age groups of our series. If such infections had taken place earlier in the life of these individuals, evidence of their presence would probably have been obliterated over the long period of time during which calcification and death of the larvae might have occurred.

It is probable, therefore, that all three of the factors discussed above were responsible for the higher degree of infection found in the older age groups. Such individuals might have been exposed to heavier infections, some may represent survivals of critical infections, while others could have had one infection superimposed on another. In regard to this last possibility, the evidence at hand demonstrates beyond any doubt that superimposed trichina infections do occur in man, that a previous infection does not protect against acquisition of or death from a superimposed infection, and that not all cases of trichinosis are diagnosed clinically or even anatomically in spite of assertions to the contrary.

SUMMARY AND CONCLUSIONS

Diaphragms have been examined from a total of 5,313 individuals coming to necropsy in 189 hospitals located in 114 cities in 37 States and the District of Columbia. Of these cases, 855, or 16.1 percent, were positive for *Trichinella spiralis*. Omitting results of examinations in a series of 200 diaphragms from Jews, of which only one was positive, the representative cases totaled 5,113, of which 854, or 16.7 percent, were positive.

The examinations were divided into several series in accordance with the source of the material. These series included material comprising 3,000 cases from Washington, D. C., and 5 eastern seaboard cities, material from individuals in States in which clinical trichinosis had never been reported, material from persons suffering sudden natural death or traumatic death without hospitalization or hospitalization for less than 24 hours, material selected at random in hospitals selected at random, material from individuals who had lived on farms or in villages of 1,000 population or less, and material from hospitals in the States of Washington and Oregon, as well as the Jewish series mentioned above.

The residence of the individuals represented in the survey embraced 41 States and the District of Columbia. Included were 4,877 cases in which individuals resided in urban communities and 436 in which the persons came from rural areas.

There were no statistically significant differences in the percentage of positives obtained in the various series or any such difference in the incidence of trichinae in the urban and rural groups.

There have been summarized post-mortem findings of trichinae in various surveys conducted by other workers in the United States. When a correction figure is applied to these findings to make allowance for differences in the techniques employed and the muscles examined, a computed incidence of trichinae of 16.4 percent is obtained in the 6,618 examinations carried out by other investigators. Including data from the present survey, there have been reported in this country a grand total of 11,931 examinations for trichinae, of which our calculations indicate 16.2 percent have been positive. Thus about one of every six persons coming to necropsy over the period represented by these surveys was infected with *Trichinella spiralis*.

Of the 855 positive cases encountered in the total of 5,313, 733, or 85.7 percent, had infections of less than 11 larvae per gram. A total of 4.5 percent of the positive cases had infections of more than 50 larvae per gram. It is believed that infections of this order are capable of causing pronounced clinical symptoms.

Infections with dead larvae predominated over infections with live larvae and infections with live larvae predominated over those with mixed live and dead larvae.

The majority of the infections of over 10 larvae per gram occurred in individuals over 54 years of age.

Data are presented to indicate beyond reasonable doubt that superimposed trichina infections occur in man, that a previous infection does not protect against acquisition of or death from a superimposed infection, and that not all cases of trichinosis are diagnosed either clinically or anatomically.

ACKNOWLEDGMENTS

This study necessitated the assistance of a large number of individuals in various parts of the United States and our success in obtaining material and the essential information relating thereto attests to the splendid cooperation which we received throughout this investigation. While it is not possible to mention all individuals by name, we are grateful to all those physicians who furnished the material for the random and rural series. Dr. David Marine, New York City, cooperated in the Jewish series. The diaphragms in the negative series were supplied for the most part by Dr. R. E. Miller, Dartmouth Medical School, Hanover, N. H., Dr. Hugh Jeter, University of Oklahoma Medical School, Oklahoma City, Okla., and Dr. A. L. Lindberg.

Tucson, Ariz. The Washington State Series was carried on in cooperation with Dr. Donald G. Evans, State Director of Health, and Dr. A. U. Simpson, Director of Laboratories, State Health Department; we are indebted also to Dr. C. R. Jensen, King County Hospital, Seattle, Dr. C. P. Larson, Tacoma General and Pierce County Hospitals, and Dr. C. R. McColl, St. Joseph Hospital, Tacoma, Wash., for their long continued cooperation in furnishing the necropsy material. Acknowledgments for assistance in the base series of examinations have already been made (*5*).

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XIV. A survey of municipal garbage disposal methods as related to the spread of trichinosis. By Willard H. Wright. Pub. Health Rep., **55**: 1069–1077 (June 14, 1940).

INCIDENCE OF HOSPITALIZATION, JULY 1943

Through the cooperation of the Hospital Service Plan Commission of the American Hospital Association, data on hospital admissions among about 8,000,000 members of Blue Cross Hospital Service Plans are presented monthly. These plans provide prepaid hospital service. The data cover about 60 hospital service plans scattered throughout the country, mostly in large cities.

Item	July 1942	July 1943
1. Number of plans supplying data	66	72
2. Number of persons eligible for hospital care	8, 846, 262	11, 076, 738
3. Number of persons admitted for hospital care	91, 212	107, 693
4. Incidence per 1,000 persons, annual rate, during current month (daily rate×365)	121. 3	114. 4
5. Incidence per 1,000 persons, annual rate for the 12 months ended July 31	107. 5	105. 5

DEATHS DURING WEEK ENDED AUGUST 14, 1943

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Aug. 14, 1943	Corresponding week, 1942
Data from 86 large cities of the United States:		
Total deaths	7, 063	6, 459
Average for 3 prior years	6, 450	
Total deaths, first 32 weeks of year	268, 368	243, 950
Deaths under 1 year of age	572	510
Average for 3 prior years	461	
Deaths under 1 year of age, first 32 weeks of year	19, 422	16, 484
Data from industrial insurance companies:		
Policies in force	65, 727, 142	64, 943, 314
Number of death claims	10, 596	10, 188
Death claims per 1,000 policies in force, annual rate	8. 4	8. 2
Death claims per 1,000 policies, first 32 weeks of year, annual rate	10. 1	9. 5

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED AUGUST 21, 1943

Summary

A total of 747 cases of poliomyelitis was reported currently, as compared with 546 for the preceding week, 183 for the corresponding week last year, and a 5-year (1938–42) median of 343. The number of cases reported currently is the largest number reported for the corresponding week of any year since 1931. An aggregate of 613 cases, or 82 percent of the current total, was reported in 11 States, as follows (last week's figures in parentheses): California, 163 (94); Illinois, 117 (70); Kansas, 76 (89); Texas, 52 (67); Connecticut, 47 (27); New York, 42 (30); Oklahoma, 38 (40); Kentucky, 22 (3); Colorado, 20 (7); Washington, 20 (13); Utah, 16 (9). Increases occurred in 8 of these States and in 15 others, but no other State reported more than 14 cases.

The accumulated total for the first 33 weeks of the year is 4,059, the largest number for the corresponding period of any year since 1934, when the comparable figure was 4,065, or about 56 percent of the total for that year.

A further decline occurred in the incidence of meningococcus meningitis from 185 to 160 cases. The 5-year median for the week is 34. The largest number of cases, 32, was reported in New York (12 in New York City). No other State reported more than 11 cases. The cumulative total for the first 33 weeks of the year is 13,528, as compared with 2,396 for the same period last year and a 5-year median of 1,417.

Cumulative figures for the first 33 weeks of the year for other diseases included in the table (figures for the corresponding period of last year in parentheses) are as follows: Anthrax, 41 (57); diphtheria, 7,265 (7,426); dysentery, all forms, 16,222 (10,588); infectious encephalitis, 428 (321); influenza, 81,667 (80,798); leprosy, 18 (35); measles, 537,131 (466,584); Rocky Mountain spotted fever, 350 (378); scarlet fever, 97,729 (89,173); smallpox, 609 (612); tularemia, 586 (650); typhoid and paratyphoid fever, 3,286 (4,025); endemic typhus fever, 2,202 (1,819); whooping cough, 131,916 (122,382).

A total of 7,543 deaths was recorded for the week in 88 large cities of the United States, as compared with 7,812 for the preceding week and a 3-year (1940–42) average of 7,141. The cumulative total for the first 33 weeks of the year is 302,827, as compared with 276,643 for the corresponding period last year.

Telegraphic morbidity reports from State health officers for the week ended Aug. 21, 1943, and comparison with corresponding week of 1942 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none were reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended		Median 1938-42	Week ended		Median 1938-42	Week ended		Median 1938-42	Week ended		Median 1938-42
	Aug. 21, 1943	Aug. 22, 1942		Aug. 21, 1943	Aug. 22, 1942		Aug. 21, 1943	Aug. 22, 1942		Aug. 21, 1943	Aug. 22, 1942	
NEW ENGLAND												
Maine	0	0	0	-----	-----	-----	8	72	15	3	0	0
New Hampshire	0	0	0	-----	-----	-----	3	0	0	1	0	0
Vermont	0	0	0	-----	-----	-----	25	11	11	0	0	0
Massachusetts	0	2	2	-----	-----	-----	55	62	65	6	2	1
Rhode Island	0	0	0	-----	-----	-----	12	4	6	1	0	0
Connecticut	0	0	0	-----	3	1	15	10	11	1	0	0
MIDDLE ATLANTIC												
New York	8	4	9	[1] 2	[1] 7	[1] 6	258	60	134	32	7	7
New Jersey	1	2	3	1	1	2	74	36	36	3	2	0
Pennsylvania	7	6	6	-----	-----	-----	35	31	51	6	3	3
EAST NORTH CENTRAL												
Ohio	6	3	3	2	1	1	69	16	15	6	0	0
Indiana	12	7	5	3	8	3	9	5	5	1	1	0
Illinois	13	19	12	4	8	2	49	7	20	10	1	1
Michigan [2]	4	1	4	-----	1	1	251	37	39	9	3	1
Wisconsin	2	0	0	10	12	11	203	78	84	8	0	0
WEST NORTH CENTRAL												
Minnesota	4	1	1	1	-----	1	24	8	8	0	0	0
Iowa	1	3	3	-----	-----	-----	2	15	15	3	2	2
Missouri	0	8	8	1	-----	-----	7	18	8	2	0	0
North Dakota	4	0	0	4	-----	5	8	7	7	1	1	0
South Dakota	0	0	0	-----	-----	-----	4	2	1	1	0	0
Nebraska	3	0	1	3	6	-----	4	19	2	0	0	0
Kansas	2	1	2	-----	1	-----	9	6	7	5	0	0
SOUTH ATLANTIC												
Delaware	1	0	0	-----	-----	-----	1	0	0	2	0	0
Maryland [3]	2	4	4	1	1	1	17	9	6	11	3	1
District of Columbia	0	1	1	-----	-----	-----	6	4	4	2	2	0
Virginia	2	8	8	58	43	42	43	8	33	8	1	1
West Virginia	5	2	6	1	-----	11	6	2	3	1	0	0
North Carolina	17	10	13	2	-----	-----	9	2	5	3	1	1
South Carolina	14	19	5	118	104	104	2	5	3	1	0	0
Georgia	13	11	12	10	8	7	9	3	4	3	0	0
Florida	1	2	2	5	1	1	3	2	2	4	3	0
EAST SOUTH CENTRAL												
Kentucky	2	4	6	1	-----	1	11	3	5	0	1	1
Tennessee	5	2	6	2	9	13	7	1	5	2	0	1
Alabama	10	7	9	17	11	11	8	9	7	3	1	0
Mississippi [3]	5	8	8	-----	-----	-----	-----	-----	-----	1	1	1
WEST SOUTH CENTRAL												
Arkansas	4	2	5	5	2	4	2	1	9	1	1	0
Louisiana	10	8	8	8	8	4	22	3	3	2	1	1
Oklahoma	3	0	3	17	11	11	2	-----	3	1	0	0
Texas	23	25	25	175	105	105	43	25	25	2	0	2
MOUNTAIN												
Montana	1	0	0	-----	1	2	21	11	10	1	0	0
Idaho	0	0	0	-----	-----	-----	17	7	2	0	0	0
Wyoming	1	0	1	2	7	-----	9	5	5	0	0	0
Colorado	3	1	4	11	16	4	13	11	5	1	1	1
New Mexico	1	1	0	-----	-----	-----	0	2	4	0	0	0
Arizona	1	2	2	22	20	9	12	3	3	2	0	0
Utah [3]	0	0	0	-----	-----	-----	10	31	13	0	0	0
Nevada	1	0	-----	-----	-----	-----	0	0	-----	0	0	-----
PACIFIC												
Washington	3	1	1	-----	1	-----	14	54	20	3	0	0
Oregon	8	0	0	-----	6	5	12	34	11	2	2	0
California	9	10	10	20	15	14	110	65	81	10	2	1
Total	212	185	185	506	407	407	1,533	804	939	160	42	34
33 weeks	7,265	7,426	8,865	81,667	80,798	151,650	537,131	466,584	466,584	13,528	2,396	1,417

See footnotes at end of table.

Telegraphic morbidity reports from State health officers for the week ended Aug. 21, 1943, and comparison with corresponding week of 1942 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [3]		
	Week ended		Median 1938–42	Week ended		Median 1938–42	Week ended		Median 1938–42	Week ended		Median 1938–42
	Aug. 21, 1943	Aug. 22, 1942		Aug. 21, 1943	Aug. 22, 1942		Aug. 21, 1943	Aug. 22, 1942		Aug. 21, 1943	Aug. 22, 1942	
NEW ENGLAND												
Maine	0	0	0	2	4	2	0	0	0	0	0	0
New Hampshire	0	1	0	2	0	1	0	0	0	0	0	0
Vermont	0	0	0	2	0	1	0	0	0	1	0	0
Massachusetts	7	0	3	66	63	34	0	0	0	11	6	3
Rhode Island	8	0	0	2	4	1	0	0	0	0	0	1
Connecticut	47	2	3	6	7	5	0	0	0	1	3	1
MIDDLE ATLANTIC												
New York	42	15	15	66	36	50	0	0	0	7	12	12
New Jersey	0	12	12	11	18	20	0	0	0	6	8	8
Pennsylvania	4	5	5	26	32	42	0	0	0	6	14	14
EAST NORTH CENTRAL												
Ohio	14	11	11	63	32	34	0	0	0	5	8	11
Indiana	1	5	5	8	13	14	0	0	1	2	6	7
Illinois	117	27	13	35	43	48	1	0	2	3	4	11
Michigan [2]	11	12	16	32	26	37	0	1	1	10	1	7
Wisconsin	1	0	1	30	37	34	0	0	0	2	0	0
WEST NORTH CENTRAL												
Minnesota	14	3	5	12	16	17	0	0	0	0	0	0
Iowa	8	7	5	10	9	9	0	0	1	1	1	3
Missouri	14	8	4	7	19	11	0	1	1	5	10	22
North Dakota	1	0	0	4	1	2	0	0	0	0	0	0
South Dakota	0	0	0	6	2	4	0	0	0	0	0	0
Nebraska	5	12	1	2	2	2	0	0	0	0	3	1
Kansas	76	3	3	20	21	21	0	0	0	5	2	3
SOUTH ATLANTIC												
Delaware	0	2	2	2	0	0	0	0	0	0	1	1
Maryland [2]	0	0	1	8	6	7	0	0	0	1	2	5
District of Columbia	0	0	3	4	12	5	0	0	0	1	0	1
Virginia	4	0	1	12	9	7	0	0	0	10	9	9
West Virginia	1	5	1	21	18	13	0	0	0	7	1	15
North Carolina	1	8	7	27	22	21	0	0	0	1	1	13
South Carolina	1	1	1	8	5	4	0	0	0	8	2	14
Georgia	0	0	1	14	6	8	0	0	0	10	21	24
Florida	0	2	2	2	0	0	0	0	0	4	10	1
EAST SOUTH CENTRAL												
Kentucky	22	10	10	6	22	21	0	0	0	22	17	23
Tennessee	2	5	3	8	31	19	0	0	0	9	6	21
Alabama	2	1	3	7	12	12	0	0	0	5	2	13
Mississippi [2]	3	1	1	10	12	4	0	0	0	6	5	7
WEST SOUTH CENTRAL												
Arkansas	8	6	2	6	6	6	0	0	0	8	11	14
Louisiana	6	3	3	5	1	5	0	0	0	8	12	15
Oklahoma	38	2	1	5	3	5	1	0	0	3	6	17
Texas	52	3	3	11	23	18	0	1	0	13	18	35
MOUNTAIN												
Montana	0	0	0	4	4	8	0	0	0	1	0	0
Idaho	1	0	0	182	0	1	0	0	0	0	0	1
Wyoming	0	0	0	1	4	0	0	0	0	0	0	0
Colorado	20	0	0	11	11	10	0	0	0	0	2	2
New Mexico	1	1	1	0	2	2	0	0	0	2	1	3
Arizona	5	0	0	3	1	1	0	0	0	1	2	2
Utah [2]	16	0	0	10	2	3	0	0	0	0	0	0
Nevada	0	0	------	0	0	------	0	0	------	0	0	------
PACIFIC												
Washington	20	1	1	18	5	8	0	0	0	1	3	4
Oregon	11	0	2	14	2	5	0	0	0	2	2	2
California	163	9	11	52	37	47	0	0	0	8	0	9
Total	747	183	343	863	641	641	2	3	12	196	212	401
33 weeks	4,059	1,505	2,072	97,729	89,173	116,482	609	612	1,958	3,286	4,025	4,993

See footnotes at end of table.

Telegraphic morbidity reports from State health officers for the week ended Aug. 21, 1943, and comparison with corresponding week of 1942 and 5-year median—Con.

Division and State	Whooping cough: Week ended Aug. 21, 1943	Whooping cough: Week ended Aug. 22, 1942	Whooping cough: Median 1938–42	Week ended Aug. 21, 1943: Anthrax	Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Leprosy	Rocky Mt. spotted fever	Tularemia	Typhus fever
NEW ENGLAND												
Maine	14	27	27	0	0	0	0	0	0	0	0	0
New Hampshire	0	7	0	0	0	0	0	0	0	0	0	0
Vermont	12	49	21	0	0	0	0	0	0	0	0	0
Massachusetts	50	139	139	0	0	2	0	0	0	0	0	0
Rhode Island	17	12	13	0	0	0	0	0	0	0	0	0
Connecticut	23	61	42	0	0	1	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	241	358	358	0	1	6	0	2	0	4	0	0
New Jersey	132	184	146	0	1	0	0	1	0	1	0	0
Pennsylvania	226	267	303	1	1	1	0	0	0	1	0	0
E. NO. CEN.												
Ohio	158	158	158	0	0	0	0	1	0	0	0	0
Indiana	32	50	15	0	0	0	0	0	0	0	0	0
Illinois	194	320	268	0	0	0	0	3	0	3	0	0
Michigan [2]	252	268	268	0	1	2	0	0	0	0	0	0
Wisconsin	312	216	214	0	0	0	0	0	0	0	0	0
W. NO. CEN.												
Minnesota	76	50	50	0	3	0	0	1	0	0	0	0
Iowa	27	26	20	0	0	0	0	0	0	0	0	0
Missouri	33	17	17	0	0	0	4	0	0	0	0	0
North Dakota	13	3	22	0	0	0	0	0	0	0	0	0
South Dakota	38	1	3	0	0	0	0	0	0	0	0	0
Nebraska	6	2	8	0	0	0	0	0	0	0	0	0
Kansas	47	21	44	0	0	0	0	0	0	0	0	1
SOUTH ATLANTIC												
Delaware	5	1	4	0	0	0	0	0	0	0	0	0
Maryland [3]	80	57	56	0	0	0	7	1	0	3	0	0
District of Columbia	17	26	12	0	0	0	0	0	0	0	0	0
Virginia	61	21	43	0	0	0	279	0	0	2	0	1
West Virginia	27	6	20	0	0	0	0	0	0	0	0	0
North Carolina	143	92	92	0	0	1	0	0	0	1	0	3
South Carolina	90	53	27	0	0	7	0	0	0	0	0	1
Georgia	9	13	19	0	1	8	1	0	0	0	0	46
Florida	33	18	16	0	3	0	0	0	0	0	0	4
E. SO. CEN.												
Kentucky	25	42	46	0	0	0	3	0	0	0	0	0
Tennessee	58	24	50	0	0	0	3	0	0	1	1	1
Alabama	50	22	22	0	0	0	0	0	0	0	0	27
Mississippi [2]	------	------	------	0	0	0	0	0	0	0	0	6
W. SO. CEN.												
Arkansas	23	9	9	0	1	29	0	0	0	0	1	1
Louisiana	4	6	10	0	2	3	0	0	0	0	0	6
Oklahoma	2	11	11	0	0	0	0	0	0	2	0	0
Texas	166	126	126	0	27	487	0	11	0	0	1	50
MOUNTAIN												
Montana	31	22	22	0	0	0	0	0	0	0	1	0
Idaho	0	2	2	0	0	0	0	0	0	0	0	0
Wyoming	0	5	4	0	0	0	0	0	0	0	4	0
Colorado	40	25	25	0	0	18	0	1	0	0	3	0
New Mexico	6	14	29	0	0	2	4	0	0	0	0	0
Arizona	11	7	24	0	0	0	27	0	0	0	0	0
Utah [2]	45	9	48	0	0	0	0	1	0	0	0	0
Nevada	1	0	------	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	42	24	27	0	0	0	0	1	0	0	0	0
Oregon	55	22	22	0	0	0	0	0	0	0	0	0
California	125	170	185	0	0	6	0	7	0	0	0	1
Total	3,052	3,063	3,295	1	41	573	328	30	0	18	11	148
33 weeks	131,916	122,382	126,631	41	1,351	10,255	4,616	428	18	350	586	2,202
33 weeks, 1942	------	------	------	57	697	5,591	4,300	321	35	378	650	1,819

[1] New York City only.

[2] Period ended earlier than Saturday.

[3] Including paratyphoid fever cases reported separately as follows: Massachusetts, 10; Connecticut, 1; New Jersey, 1; Virginia, 1; South Carolina, 2; Georgia, 1; Tennessee, 1; Louisiana, 1; Texas, 1; California, 2.

WEEKLY REPORTS FROM CITIES

City reports for week ended Aug. 7, 1943

This table lists the reports from 85 cities of more than 10,000 population distributed throughout the United States and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0		0	8	0	1	0	0	0	0	2
New Hampshire:												
Concord	0	0		1	0	0	0	0	1	0	0	0
Vermont:												
Barre	0	0		0	0	0	0	0	1	0	0	0
Massachusetts:												
Boston	0	0		0	12	7	12	0	16	0	0	29
Fall River	0	0		0	0	0	0	0	0	0	0	3
Springfield	0	0		0	5	0	0	0	3	0	0	1
Worcester	0	0		0	3	0	1	0	2	0	0	6
Rhode Island:												
Providence	0	0		0	40	0	1	4	2	0	1	34
Connecticut:												
Bridgeport	0	0		0	0	1	0	0	0	0	0	0
Hartford	0	0	1	1	1	0	0	0	1	0	0	4
New Haven	0	0		0	10	1	0	10	2	0	0	12
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0		0	0	2	4	0	5	0	1	6
New York	4	1	2	0	169	16	33	11	34	0	5	78
Rochester	0	0		0	4	0	0	0	1	0	1	9
Syracuse	0	0		0	0	0	1	0	0	0	0	12
New Jersey:												
Camden	0	0		0	0	0	0	0	0	0	2	3
Newark	0	0	3	0	14	1	2	0	0	0	0	32
Trenton	0	0		0	1	0	0	0	1	0	0	1
Pennsylvania:												
Philadelphia	1	0		0	3	9	20	0	9	0	2	58
Pittsburgh	3	0		0	10	2	13	1	4	0	0	32
Reading	0	0		0	1	0	0	0	0	0	0	3
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	1	0		1	3	0	1	0	1	0	0	5
Cleveland	1	0	2	0	3	1	1	0	14	0	1	43
Columbus	0	0		0	10	0	1	0	3	0	0	17
Indiana:												
Fort Wayne	1	0		0	5	0	1	0	0	0	0	0
Indianapolis	0	0		0	3	0	1	0	2	0	0	17
South Bend	0	0		0	1	0	0	0	1	0	0	1
Terre Haute	0	0		0	0	0	1	0	1	0	0	0
Illinois:												
Chicago	4	0		0	37	10	7	26	6	0	0	88
Springfield	0	0		0	0	0	1	0	0	0	0	0
Michigan:												
Detroit	1	0		0	43	3	7	1	6	0	2	66
Flint	0	0		0	0	0	0	0	0	0	0	6
Grand Rapids	0	0		0	22	0	0	0	0	0	0	15
Wisconsin:												
Kenosha	0	0		0	0	0	0	0	2	0	0	2
Milwaukee	0	1		0	25	0	0	1	9	0	0	103
Racine	0	0		0	1	0	1	0	2	0	0	4
Superior	0	0		0	10	0	0	0	1	0	0	0
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0		0	10	0	1	0	1	0	0	9
Minneapolis	1	0		0	3	1	2	2	1	0	0	6
St. Paul	1	0		0	6	1	2	3	1	0	0	46

City reports for week ended Aug. 7, 1943—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Missouri:												
Kansas City	0	0	------	0	4	0	6	7	2	0	0	6
St. Joseph	0	0	------	0	1	1	0	0	1	0	0	11
St. Louis	0	0	------	0	7	1	8	0	6	0	2	25
North Dakota:												
Fargo	0	0	------	0	7	0	0	0	0	0	0	4
Nebraska:												
Omaha	0	0	------	0	0	0	1	3	3	0	0	0
Kansas:												
Topeka	0	0	------	0	1	0	2	3	0	0	0	0
Wichita	0	0	------	0	1	2	0	11	0	0	0	4
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	2	0	0	0	1	0	0	0
Maryland:												
Baltimore	0	0	1	0	25	3	11	0	4	0	0	96
Cumberland	0	0	------	0	0	0	0	0	0	0	0	0
Frederick	0	0	------	0	0	0	0	0	0	0	0	0
District of Columbia:												
Washington	1	0	------	0	22	0	3	0	4	0	0	28
Virginia:												
Lynchburg	0	0	------	0	25	1	1	0	0	0	1	12
Richmond	0	0	------	0	4	4	0	1	1	0	0	3
Roanoke	0	0	------	0	1	0	0	0	0	0	0	0
West Virginia:												
Wheeling	0	0	------	0	0	1	0	0	0	0	0	15
North Carolina:												
Winston-Salem	1	0	------	0	0	0	0	0	0	0	0	12
South Carolina:												
Charleston	0	0	3	0	0	0	1	0	1	0	0	2
Georgia:												
Atlanta	2	0	9	0	0	0	2	0	2	0	0	1
Brunswick	0	0	------	0	0	0	1	0	0	0	0	0
Savannah	0	0	------	0	0	1	0	0	0	0	0	0
Florida:												
Tampa	0	0	------	0	0	0	4	0	0	0	0	0
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	------	0	0	0	1	0	1	0	0	20
Nashville	0	0	------	0	1	0	4	0	3	0	0	3
Alabama:												
Birmingham	0	0	------	0	1	1	2	1	3	0	2	5
Mobile	0	0	------	0	0	0	1	0	0	0	0	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	------	0	0	0	3	0	0	0	0	0
Louisiana:												
New Orleans	0	0	1	1	0	1	8	2	1	0	0	3
Shreveport	0	0	------	0	0	0	3	4	0	0	2	0
Texas:												
Dallas	0	0	------	0	3	0	1	3	1	0	1	4
Galveston	0	0	------	0	0	0	2	1	0	0	0	5
Houston	1	1	------	0	0	0	5	4	1	0	0	7
San Antonio	0	1	------	0	80	0	6	0	0	0	0	1
MOUNTAIN												
Montana:												
Billings	1	0	------	0	2	0	0	0	0	0	0	0
Helena	0	0	------	0	0	0	1	0	0	0	0	0
Missoula	0	0	------	0	0	0	0	0	1	0	0	0
Idaho:												
Boise	0	0	------	0	0	0	0	0	0	0	0	0
Colorado:												
Denver	0	0	3	0	2	0	4	1	3	0	0	35
Pueblo	0	0	------	0	0	0	1	0	1	0	0	4

City reports for week ended Aug. 7, 1943—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza Cases	Influenza Deaths	Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
PACIFIC												
Washington:												
Seattle	2	0	------	0	8	2	4	3	0	0	0	12
Spokane	0	0	------	0	4	0	0	0	9	0	0	6
Tacoma	0	0	------	0	1	0	0	0	0	0	0	0
California:												
Los Angeles	2	0	4	0	18	4	5	12	10	0	0	39
Sacramento	1	1	------	0	0	1	1	3	2	0	0	1
San Francisco	0	0	------	0	8	2	7	9	8	0	2	4
Total	29	5	29	4	691	80	214	127	197	0	25	1,121
Corresponding week, 1942	43	6	25	5	266	29	231	23	225	2	33	1,235
Average, 1938–42	54	------	28	[1] 6	[2] 400	------	[1] 233	------	208	2	47	1,355

Dysentery, amebic.—Cases: New York, 2.

Dysentery, bacillary.—Cases: New York, 6; Syracuse, 1; Chicago, 1; Detroit, 3; St. Louis, 1; Richmond, 3; Charleston, S. C., 25; Atlanta, 2; Nashville, 4; Galveston, 1; Los Angeles, 7.

Dysentery, unspecified—Cases: Baltimore, 2; Washington, 1; Richmond, 4; Dallas, 1; San Antonio, 8.

Rocky Mountain spotted fever.—Cases: Lynchburg, 1; Richmond, 5; Nashville, 1.

Typhus fever.—Cases: New York, 3; Charleston, S. C., 2; Atlanta, 2; Savannah, 3; Mobile, 4; New Orleans, 3; Dallas, 2; Houston, 2.

[1] 3-year average, 1940–42.
[2] 5-year median.

Rates (annual basis) per 100,000 population, by geographic groups, for the 85 cities in the preceding table (estimated population, 1942, 34,430,900)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza Case rates	Influenza Death rates	Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
New England	0.0	0.0	2.5	5.0	196	22.4	37.3	34.8	69.6	0.0	2.5	226
Middle Atlantic	3.6	.4	2.2	0	90	13.4	32.6	5.4	24.1	0	4.9	104
East North Central	4.7	.6	1.2	.6	95	8.2	12.8	16.4	28.0	0	1.8	214
West North Central	3.9	0	0	0	78	11.7	43.0	56.7	29.3	0	3.9	217
South Atlantic	7.1	0	23.1	0	140	17.7	40.8	1.8	23.1	0	1.8	300
East South Central	0	0	0	0	12	5.9	47.5	5.9	41.6	0	11.9	166
West South Central	2.9	5.9	2.9	2.9	243	2.9	82.1	41.1	8.8	0	8.8	59
Mountain	11.2	0	33.6	0	45	0	67.3	11.2	56.1	0	0	437
Pacific	8.7	1.7	7.0	0	68	15.7	29.7	47.2	41.9	0	3.5	108
Total	4.4	.8	4.4	.6	105	12.1	32.4	19.2	29.8	0	3.8	170

TERRITORIES AND POSSESSIONS

Hawaii Territory

Honolulu—Dengue fever.—Up to August 20, 1943, a total of 76 cases of dengue fever among civilians has been reported in Honolulu, T. H. All control measures are being taken. (See also p. 1290 of the Public Health Reports of August 20, 1943.)

Panama Canal Zone

Notifiable diseases—June 1943.—During the month of June 1943, certain notifiable diseases were reported in the Panama Canal Zone and terminal cities as follows:

Disease	Panama		Colon		Canal Zone		Outside the Zone and terminal cities		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chickenpox	7		4		2				13	
Diphtheria	10	1	1				1		12	1
Dysentery (amebic)	3				2		6	1	11	1
Dysentery (bacillary)			1		1		1	1	3	1
Leprosy	1						1		2	
Malaria [1]	19	1	2	1	204		83	1	308	3
Measles	1				8				9	
Meningitis, meningococcus			1						1	
Mumps	57		5		37		6		105	
Paratyphoid fever	[2] 3						2		[2] 5	
Pneumonia		11		5	15			4	[3] 15	20
Tuberculosis		12		4	5	1		10	[3] 5	27
Typhoid fever							2		2	

[1] 81 recurrent cases.
[2] Includes 1 carrier.
[3] Cases reported in the Canal Zone only.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended July 24, 1943.—During the week ended July 24, 1943, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		16	1	31	130	15	24	30	21	268
Diphtheria		13	2	16	4	5				40
Dysentery (bacillary)				3						3
Encephalitis, infectious									1	1
German measles				4	20	3		9	11	47
Influenza			3	3	6				2	14
Measles		18	2	121	417	52	13	136	55	814
Meningitis, meningococcus				2	3	1			2	8
Mumps		36		14	82	22	1	12	33	200
Poliomyelitis					1					1
Scarlet fever		1	4	41	39	11	11	24	15	146
Tuberculosis (all forms)	12	2	2	84	57	10		2	29	198
Typhoid and paratyphoid fever			1	3		1	2		2	9
Undulant fever					1					1
Whooping cough		2		171	127	14	37	44	25	420

CUBA

Provinces—Notifiable diseases—4 weeks ended July 17, 1943.—During the 4 weeks ended July 17, 1943, cases of certain notifiable diseases were reported in the Provinces of Cuba as follows:

Disease	Pinar del Rio	Habana [1]	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer			2	14		14	30
Chickenpox		1		1			2
Diphtheria	1	32	2	1	2	2	40
Hookworm disease		31					31
Leprosy		9		1	1	2	13
Malaria	33	11	14	23	10	110	201
Measles		10	3				13
Meningitis, meningococcus	1						1
Poliomyelitis	2	1		1		4	8
Rabies				1			1
Scarlet fever		4					4
Tuberculosis	20	21	23	30	3	48	145
Typhoid fever	13	90	29	199	41	33	405
Whooping cough	2		1	2		1	6

[1] Includes the city of Habana.

JAMAICA

Notifiable diseases—4 weeks ended July 31, 1943.—During the 4 weeks ended July 31, 1943, cases of certain notifiable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chickenpox	6	17	Puerperal fever		1
Diphtheria	3	3	Tuberculosis	35	85
Dysentery	4	2	Typhoid fever	15	51
Erysipelas	1		Typhus fever		1
Leprosy		5			

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Health, Pan American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases]

NOTE.—Since many of the figures in the following tables are from weekly reports, the accumulated totals are for approximate dates.

Place		January-May 1943	June 1943	July 1943—week ended—				
				3	10	17	24	31
ASIA								
Ceylon	C	48	2					
India	C	89,135	11,783	6,883				
Bombay	C		3					
Calcutta	C	1,367	669	314	334			
Cochin.[1]								
Madras	C	964						
Negapatam	C		6	15				
Vizagapatam	C	4						
India (French)	C	49						
Chandernagor	C	4						
Karikal	C	28						
Pondichery	C	17						

[1] Information dated Aug. 17, 1943, states that cholera is present in epidemic form in the port of Cochin and vicinity.

PLAGUE

[C indicates cases; D, deaths; P, present]

Place		January-May 1943	June 1943	3	10	17	24	31
AFRICA								
Basutoland[1]	C	11	P					
Belgian Congo—Plague-infected rats		P						
British East Africa:								
Kenya	C	11						
Uganda	C	8	5		1			
Madagascar	C	17						
Morocco (French)	C	198	27					
Senegal	C	72	71		22			
Dakar	C		18		8			
Union of South Africa	C	53						
ASIA								
India	C	1,209	45	57				
Indochina	C	12	3		3			
Palestine	C	8	3	1				

[1] For the period June 12–30, 1943, pneumonic plague occurred in a village near Mafeteng, Basutoland, all cases being fatal.

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		January-May 1943	June 1943	July 1943—week ended— 3	10	17	24	31
SOUTH AMERICA								
Peru:								
Lambayeque Department	C	2						
Libertad Department	C	15						
Lima Department	C	3						
Lima	C	1						
Plague-infected rats		P						
Piura Department	C	2						
Venezuela	C					[2] 7		
OCEANIA								
Hawaii Territory:								
Hamakua District	D	4						
Plague-infected rats		[3] 64	2		1	1		1

[2] For the period July 1-14, 1943.
[3] Includes 3 plague-infected mice.

SMALLPOX

[C indicates cases; D, deaths]

Place		January-May 1943	June 1943	July 1943—week ended— 3	10	17	24	31
AFRICA								
Algeria	C	573	148					
Angola	C	517						
Basutoland	C	38						
Belgian Congo	C	1,187	300	94				
British East Africa:								
Kenya	C		20	2	86			
Mombasa	C	3						
Tanganyika	C	11						
Dahomey	C	129	6					
Egypt	C	531	555	173	134	99		
French Guinea	C	126	1		2			
Gold Coast	C	5						
Ivory Coast	C	101	25		1			
Mauritania	C	1			6			
Morocco (French)	C	679	28					
Mozambique	C	1						
Nigeria	C	2,975	588	110	176	124		
Niger Territory	C	156	4		2			
Senegal	C	27	30		1			
Sierra Leone	C	3						
Sudan (French)	C	1,538	546		572			
Union of South Africa	C	221	3					
ASIA								
Ceylon	C	1	1					
India	C	14,468	4,464	1,416	224			
India (French)	C	10						
Indochina	C	3,358	318		83			
Iran	C	217	59					
Iraq	C	179		6				
Palestine	C	29						
Syria and Lebanon	C	764	32	18	19			
Trans-Jordan	C	11						
EUROPE								
Belgium	C	1						
France	C	1	1					
Germany	C	1						
Scotland	C	1						
Portugal	C	23	11	2	1			
Spain	C	159	25					
Switzerland	C	5	2					
Turkey	C	5,625						
NORTH AMERICA								
Canada	C	1			1	2		
Guatemala	C	4	1					
Mexico	C	110	56					
SOUTH AMERICA								
Brazil	C	40						
British Guiana	C		1					
Colombia	C	130	41					
Ecuador	C	10						
Peru	D	9						
Venezuela	C	27	7					

TYPHUS FEVER

[C indicates cases]

Place		January-May 1943	June 1943	July 1943—week ended— 3	10	17	24	31
AFRICA								
Algeria	C	6,824	630		141			
Belgian Congo	C	2		2				
British East Africa:								
Kenya	C	5	1					
Mombasa	C	1						
Uganda	C	1						
Egypt	C	29,161	5,308	988	918	754		
Gold Coast	C	4	2					
Morocco (French)	C	11,612	1,225					
Morocco (Spanish)	C	62	1					
Nigeria	C	8	1	1				
Rhodesia, northern	C	4						
Senegal	C	2						
Sierra Leone	C	3						
Union of South Africa	C	778	1					
ASIA								
Afghanistan	C	520						
China: Shanghai	C	12						
India	C	1,011	38	5				
Iran	C	7,447	910					
Iraq	C	1,240	135	20	10	8		
Palestine	C	157	41	12	4			
Syria and Lebanon	C	23	25	14	2			
Trans-Jordan	C	12						
EUROPE								
Bulgaria	C	[1] 1,250						
France—Seine Department	C	2						
Germany	C	[2] 800						
Hungary	C	596	62	8	7	10		3
Irish Free State	C	19						
Portugal	C	5					2	
Rumania	C	5,585	677					[3] 403
Slovakia	C	255	70		9	14	11	
Spain	C	404	89	3				
Turkey	C	2,549						
NORTH AMERICA								
Guatemala	C	441	96					
Jamaica	C	11	1					
Mexico	C	654	60					
Puerto Rico	C	2						
SOUTH AMERICA								
Chile	C	130	21	4	2			
Ecuador	C	144	18					
Peru	C	7	1					
Venezuela	C	8	2					
OCEANIA								
Australia	C	52	11		2	1		
Hawaii Territory	C	10	1					

[1] For the period Jan. 1 to July 14, 1943.
[2] For the first 7 weeks of 1943.
[3] For the month of July.

YELLOW FEVER

[C indicates cases; D, deaths]

Place		January-May 1943	June 1943	July 1943—week ended— 3	10	17	24	31
AFRICA								
Belgian Congo:								
Bondo	D	1						
Leopoldville	C	1						
Stanleyville	D	1						
Yanonge	C	1						
Sierra Leone: Freetown	C		[1] 1					
SOUTH AMERICA								
Colombia:								
Cundinamarca Department	D	1	2					
Intendencia of Meta	D	2						

[1] Suspected.